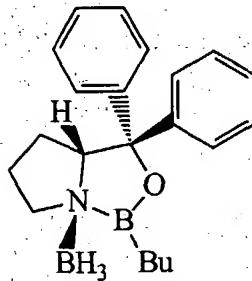
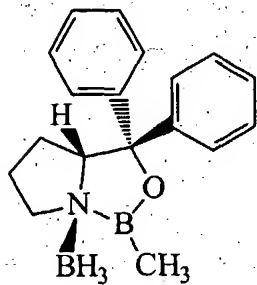
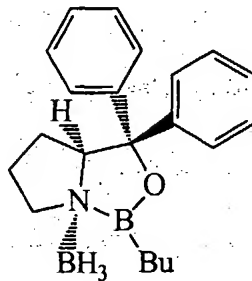
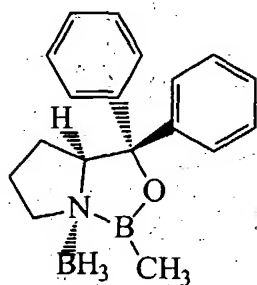


2. A method according to claim 1, wherein the fused ring base is a steroid ring base.
3. A method according to claim 1, wherein the chiral oxazaborolidine reagent includes a member selected from the group consisting of the following compounds:



4. A method according to claim 1, further including reducing the unsaturated alkyl alcohol to produce a saturated alkyl alcohol.

5. A method for stereoselectively reducing an alkeneone substituent attached to a fused ring base, comprising:

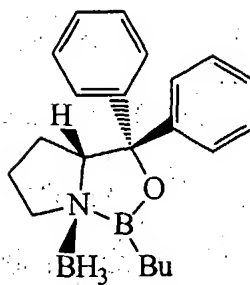
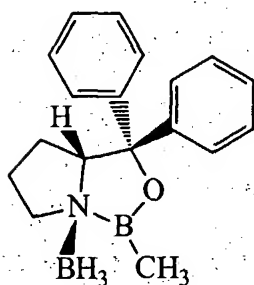
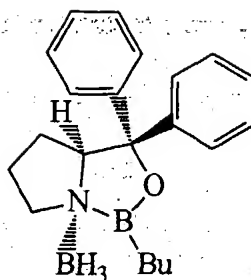
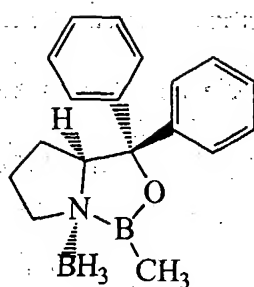
reacting the alkeneone with a chiral oxazaborolidine reagent to stereoselectively reduce the alkeneone to an allylic alcohol.

6. A method according to claim 5, wherein the fused ring base is a steroid ring base, and the alkeneone substituent is a 22-ene-24-one substituent on the steroid ring base.

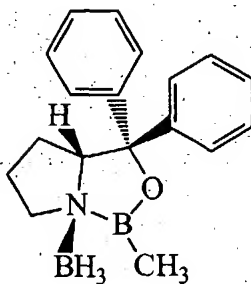
7. A method according to claim 6, wherein, prior to the reacting step, the 22-ene-24-one substituent is produced from a C-22 aldehyde substituent on the steroid ring base.

8. A method according to claim 7, wherein the aldehyde substituent is reacted with a Wittig reagent to produce the 22-ene-24-one substituent on the steroid ring base.

9. A method according to claim 5, wherein the chiral oxazaborolidine reagent includes a member selected from the group consisting of the following compounds:



10. A method according to claim 5, wherein the chiral oxazaborolidine reagent is:



11. A method according to claim 5, further including reducing the allylic alcohol to produce a hydroxylated, saturated alkane substituent on the fused ring base.

12. A method for stereoselectively reducing an alkyneone substituent attached to a fused ring base, comprising:

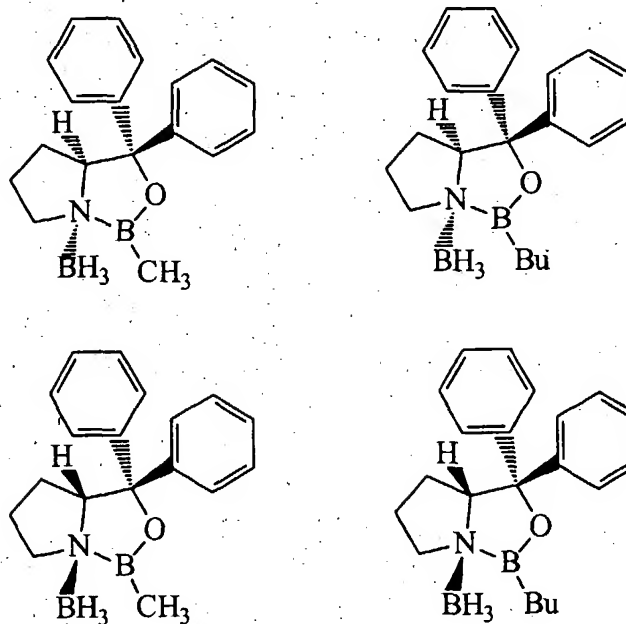
reacting the alkyneone with a chiral oxazaborolidine reagent to stereoselectively reduce the alkyneone to a propargylic alcohol.

13. A method according to claim 12, wherein the fused ring base is a steroid ring base, and the alkyneone is a 22-yne-24-one substituent on the steroid ring base.

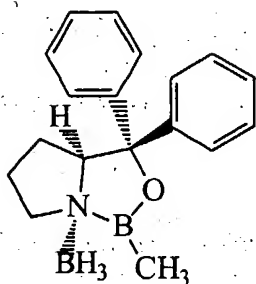
14. A method according to claim 13, wherein, prior to the reaction step, the 22-yne-24-one substituent is produced from a C-22 aldehyde on the steroid ring base.

15. A method according to claim 14, wherein the aldehyde is reacted to produce a 22-alkyne substituent on the steroid ring base, and the 22-alkyne substituent is reacted with a lithium containing reagent and anhydride to produce the 22-yne-24-one substituent on the steroid ring base.

16. A method according to claim 12, wherein the chiral oxazaborolidine reagent includes a member selected from the group consisting of the following compounds:

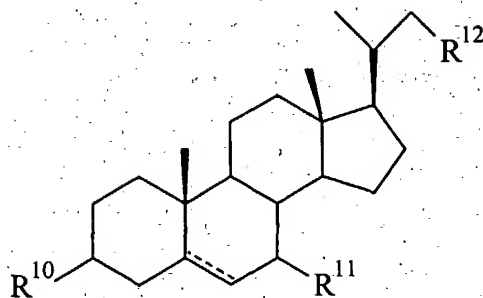


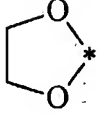
17. A method according to claim 12, wherein the chiral oxazaborolidine reagent is:


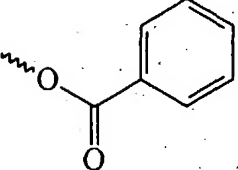


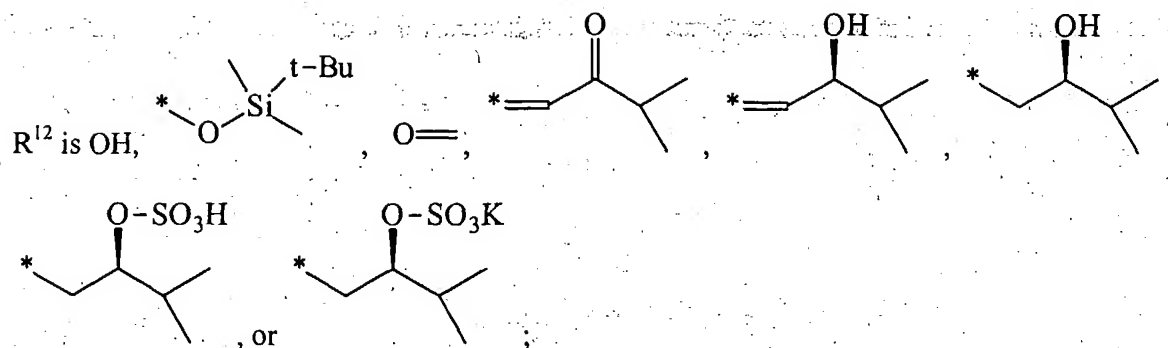
18. A method according to claim 12, further including reducing the propargylic alcohol to produce a hydroxylated, saturated alkane substituent on the fused ring base.


19. An intermediate in the synthesis of squalamine or a homologous aminosterol having the composition:



wherein  $R^{10}$  is  $O=$ , , or  $*-N-CH_2-CH_2-CH_2-CH_2-N-CH_2-CH_2-CH_2-CH_2-C\equiv N$ ,

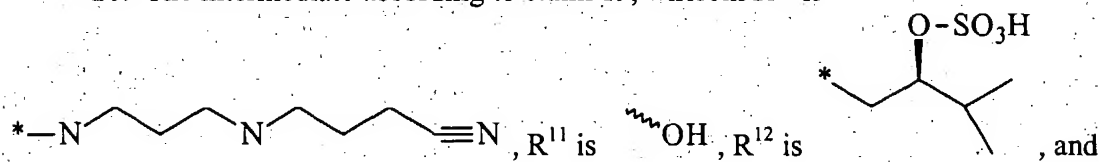
$R^{11}$  is H,  $O=$ , , or  ;





 represents either a single or double bond; and

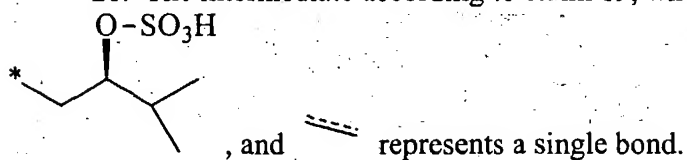
\* represents the location where the  $R^{10}$  or  $R^{12}$  moieties are bonded to the remainder of the steroid molecule.

20. The intermediate according to claim 19, wherein  $R^{10}$  is

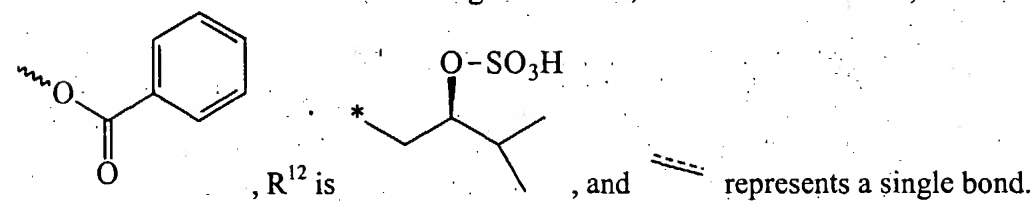


 represents a single bond.

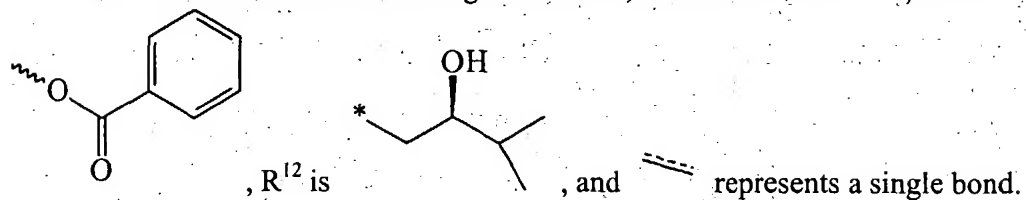
21. The intermediate according to claim 19, wherein  $R^{10}$  is  $O=$ ,  $R^{11}$  is ,  $R^{12}$  is

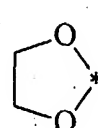


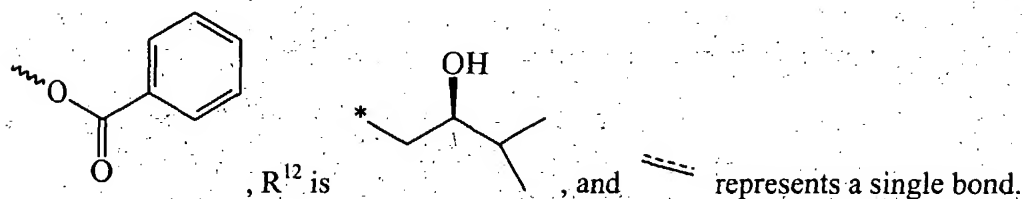
22. The intermediate according to claim 19, wherein  $R^{10}$  is  $O=$ ,  $R^{11}$  is

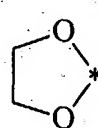


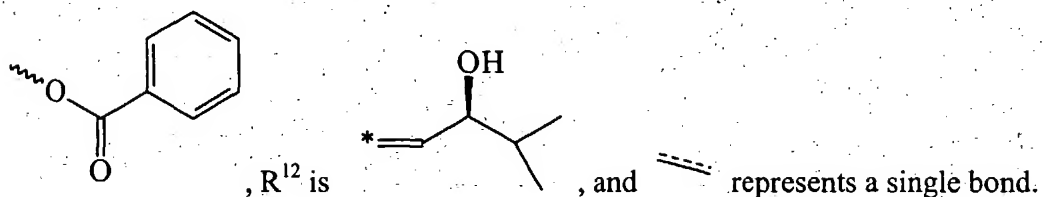
23. The intermediate according to claim 19, wherein  $R^{10}$  is  $O=$ ,  $R^{11}$  is

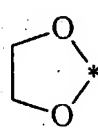


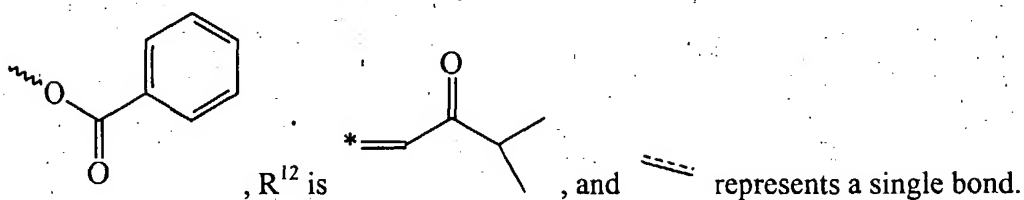
24. The intermediate according to claim 19, wherein  $R^{10}$  is  ,  $R^{11}$  is

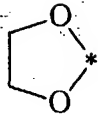


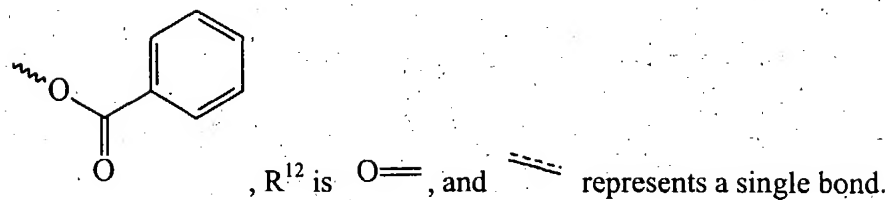
25. The intermediate according to claim 19, wherein  $R^{10}$  is  ,  $R^{11}$  is

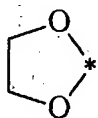


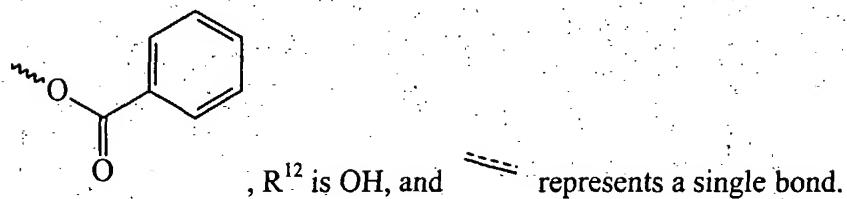
26. The intermediate according to claim 19, wherein  $R^{10}$  is  ,  $R^{11}$  is

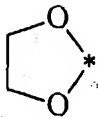


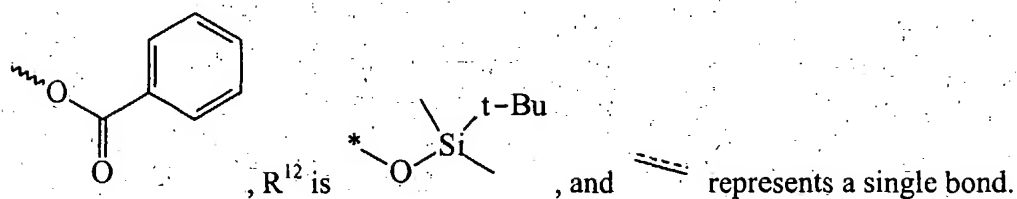
27. The intermediate according to claim 19, wherein  $R^{10}$  is ,  $R^{11}$  is

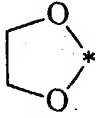



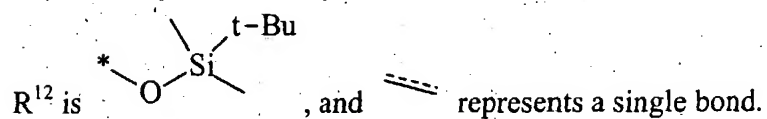
28. The intermediate according to claim 19, wherein  $R^{10}$  is ,  $R^{11}$  is



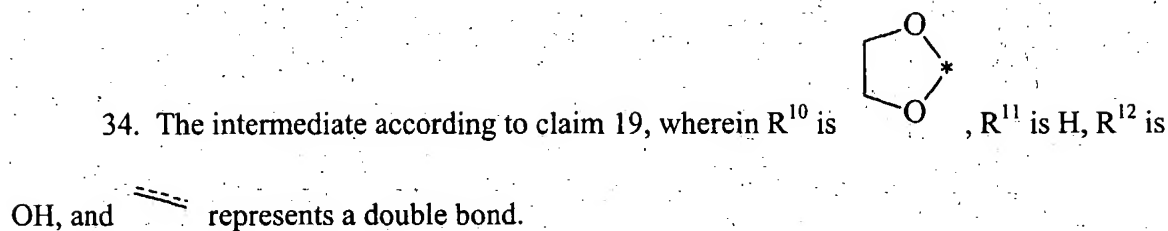
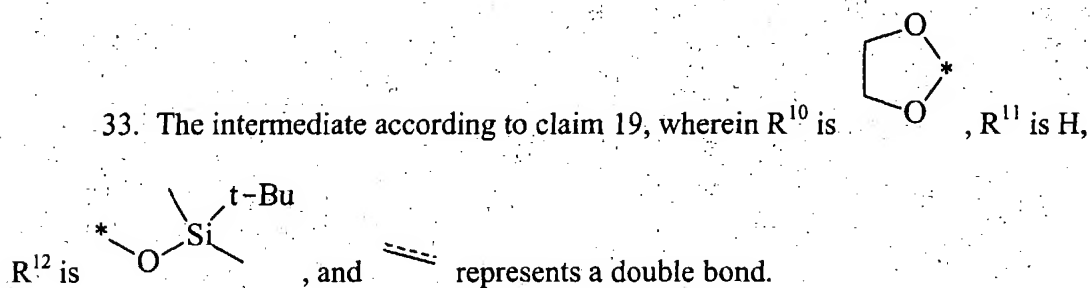
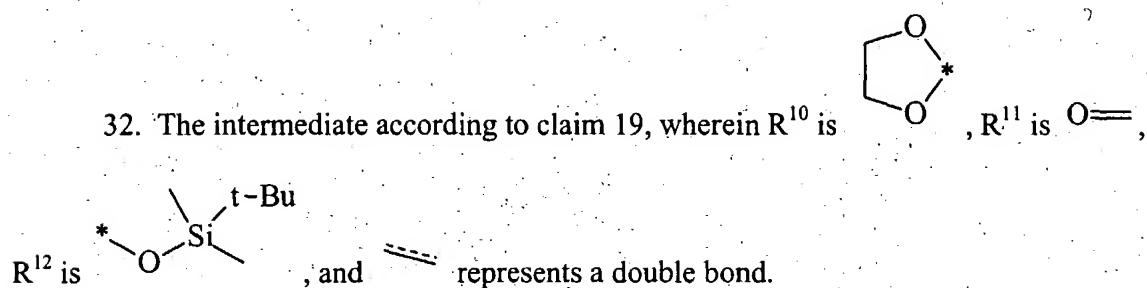
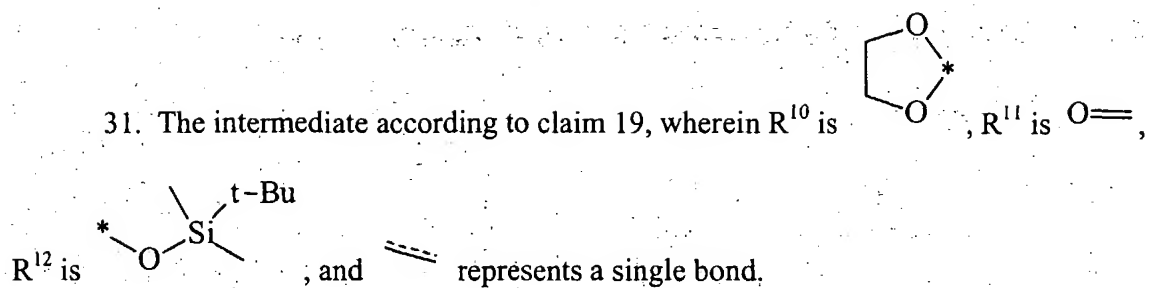
29. The intermediate according to claim 19, wherein  $R^{10}$  is ,  $R^{11}$  is



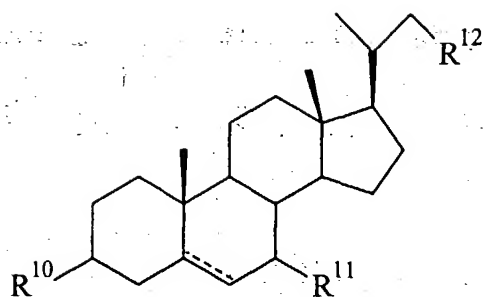
30. The intermediate according to claim 19, wherein  $R^{10}$  is ,  $R^{11}$  is OH,



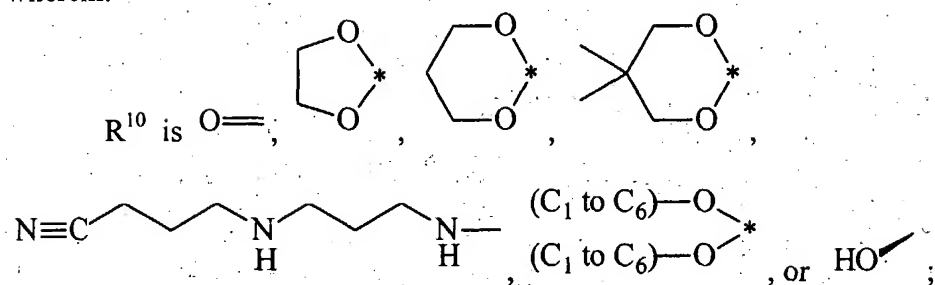






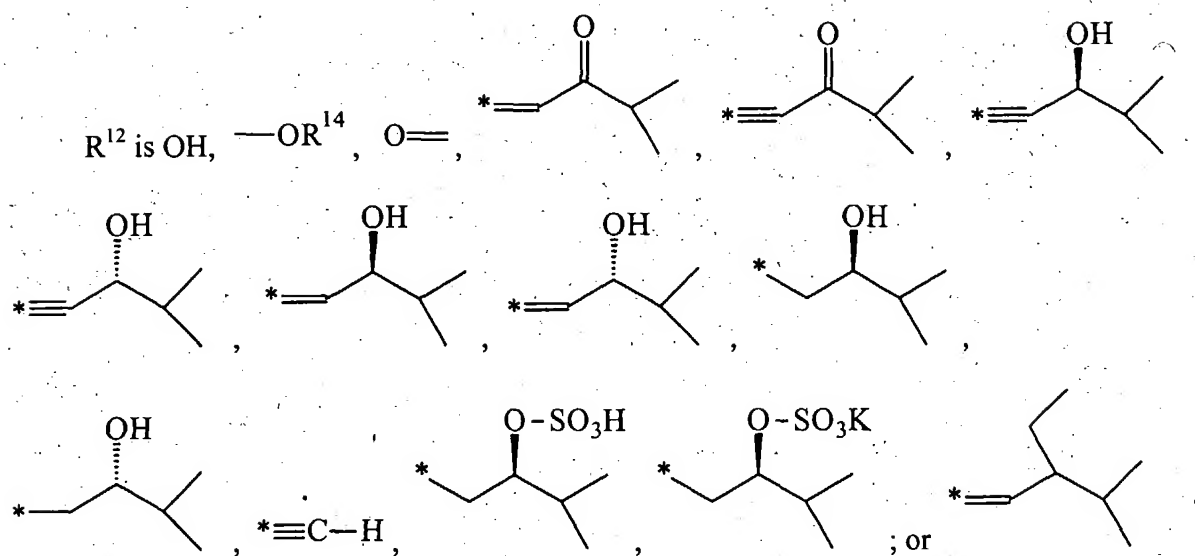
35. An intermediate in the synthesis of squalamine or a homologous aminosterol having the composition:




wherein:



$R^{11}$  is  $H$ ,  $O=$ ,  $HO-$  , or  $R^{13}-O-$  ;



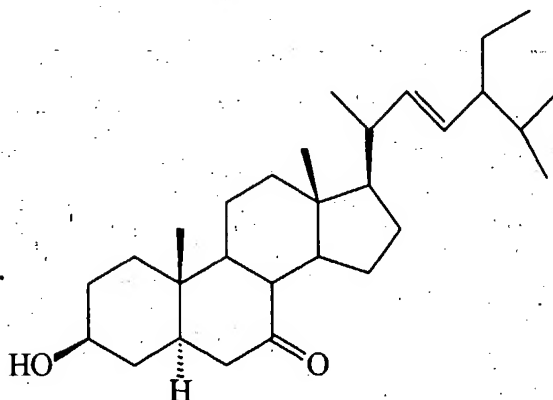
 represents either a single or double bond;

\* represents the location where the R<sup>10</sup> or R<sup>12</sup> moieties are bonded to the remainder of the steroid molecule;

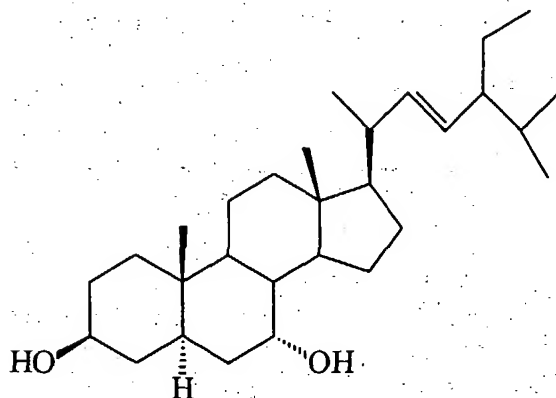
C<sub>1</sub> to C<sub>6</sub>, each independently represents an alkyl, alkenyl, or alkynyl group, having 1 to 6 carbon atoms, wherein the group may be substituted or unsubstituted; and

R<sup>13</sup> and R<sup>14</sup>, each independently represents formyl; acetyl; propionyl; pivaloyl; cyanoacetyl; benzoyl; benzoyl ortho or para substituted with nitro, halogen, or alkoxy; methoxycarbonyl (methylcarbonate); ethoxycarbonyl; benzyloxycarbonyl; benzyl; benzyl ortho or para substituted with nitro; benzyl para substituted with a halogen; benzyl para substituted with a methoxy; benzyloxymethyl; benzyloxymethyl ortho or para substituted with nitro; benzyloxymethyl para substituted with a halogen; benzyloxymethyl para substituted with a methoxy; tetrahydrothiopyranyl; tetrahydrothiofuranyl; methylthiomethyl; trialkylsilyl, wherein each alkyl is independently selected from the group of methyl, ethyl, isopropyl, *sec*-butyl, *tert*-butyl, and phenyl; tetrahydropyranyl; 2-methoxyethoxymethyl; and methoxymethyl.

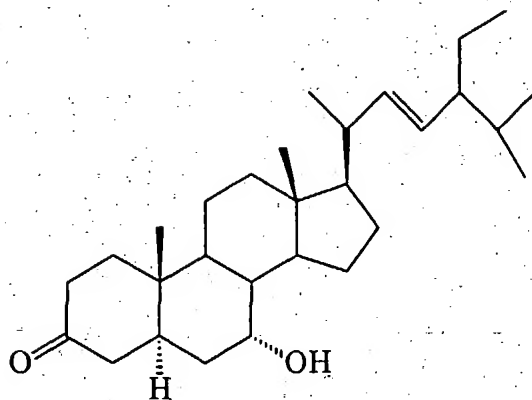
36. The intermediate according to claim 35, having the following composition:



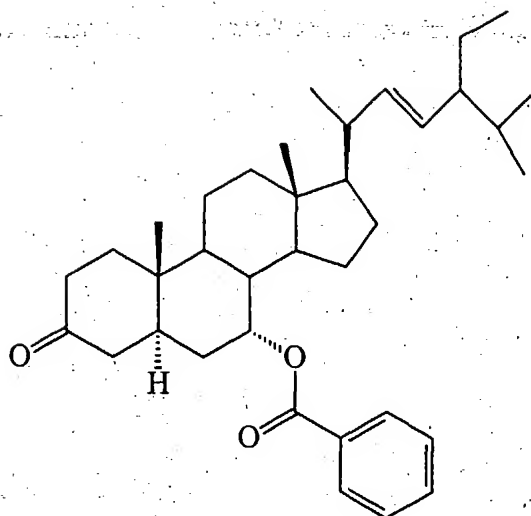
37. The intermediate according to claim 35, having the following composition:



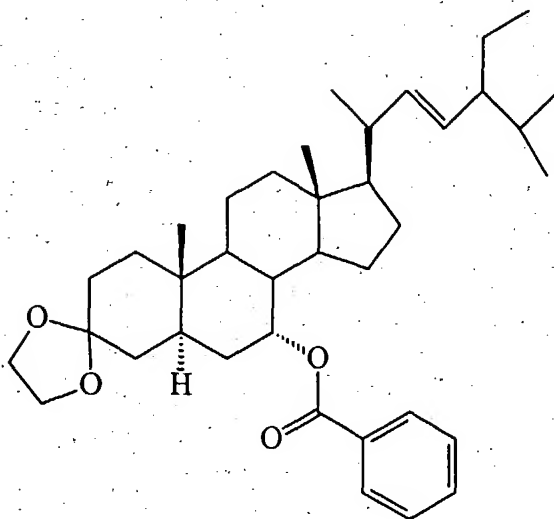
38. The intermediate according to claim 35, having the following composition:



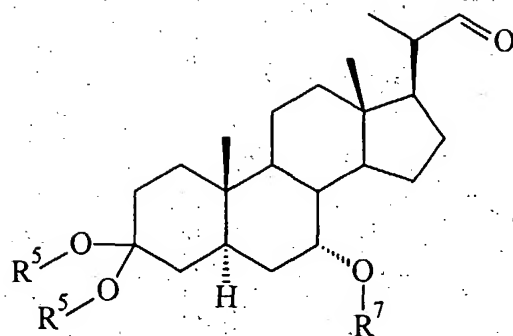
39. The intermediate according to claim 35, having the following composition:



40. The intermediate according to claim 35, having the following composition:

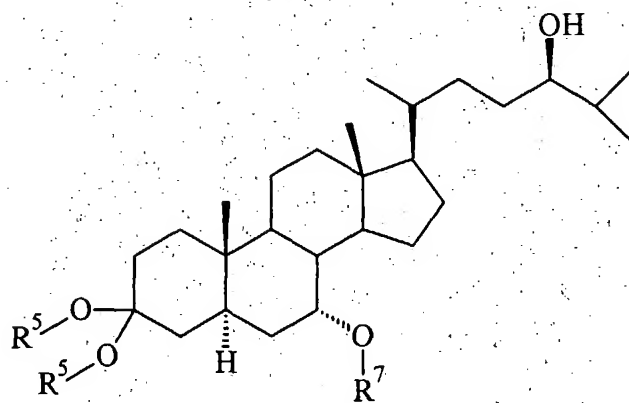


41. A method for producing an aminosterol compound selected from the group consisting of squalamine, compound 1436, and salts thereof, the method comprising:  
converting, under sufficient conditions, a compound according to formula 129:



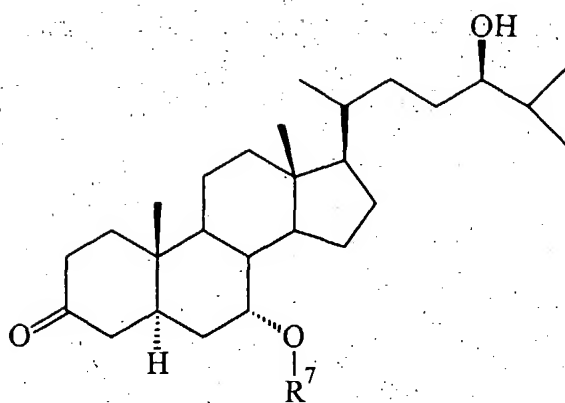
(129),

wherein the R<sup>5</sup> groups are suitable protecting groups that can be the same or different, or the R<sup>5</sup> groups can join together to form a ring structure, and R<sup>7</sup> is a suitable protecting group, to a compound according to formula 134:



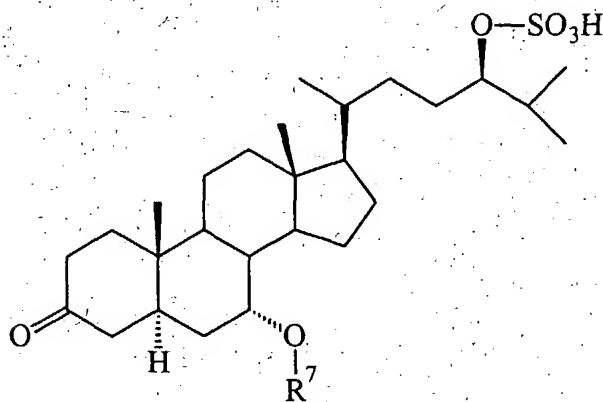
(134);

converting, under sufficient conditions, the compound according to formula 134 to a compound according to formula 135:



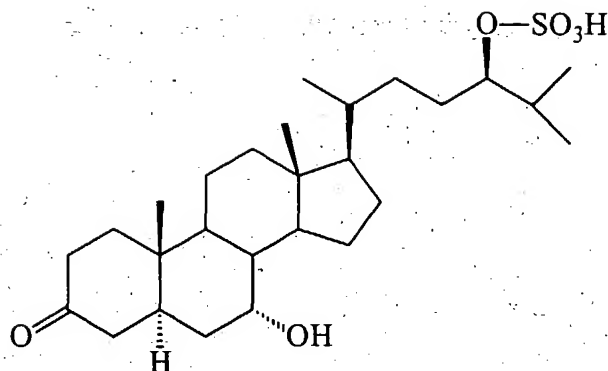
(135);

converting, under sufficient conditions, the compound according to formula 135 to a compound according to formula 136:



(136);

converting, under sufficient conditions, the compound according to formula 136 to a compound according to formula 37:



(37); and

converting, under sufficient conditions, the compound according to formula 37 to squalamine, compound 1436, or a salt thereof.

42. A method according to claim 41, wherein the compound according to formula 37 is converted into compound 1436 or a salt thereof.

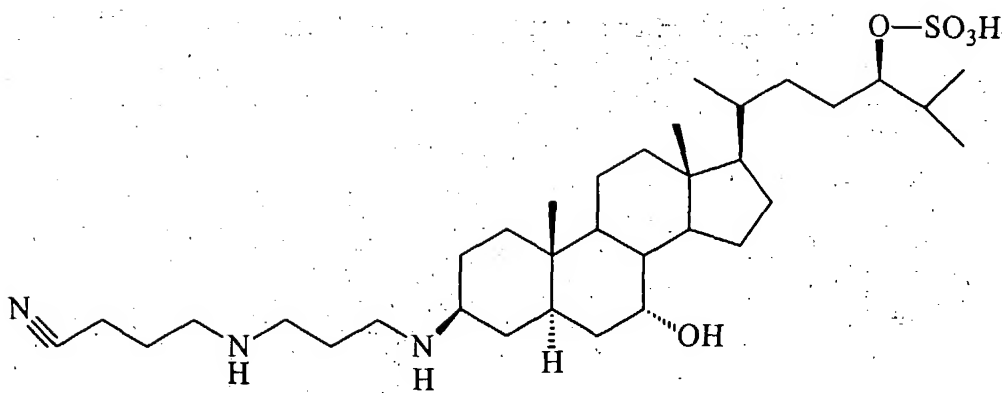
43. A method according to claim 41, wherein the compound according to formula 37 is converted into squalamine or a salt thereof.

44. A method according to claim 43, wherein compound 37 is converted into squalamine as follows:

converting, under sufficient conditions, the compound according to formula 37 into its corresponding potassium salt;

converting, under sufficient conditions, the potassium salt of the compound according to formula 37 into a compound according to formula 43:



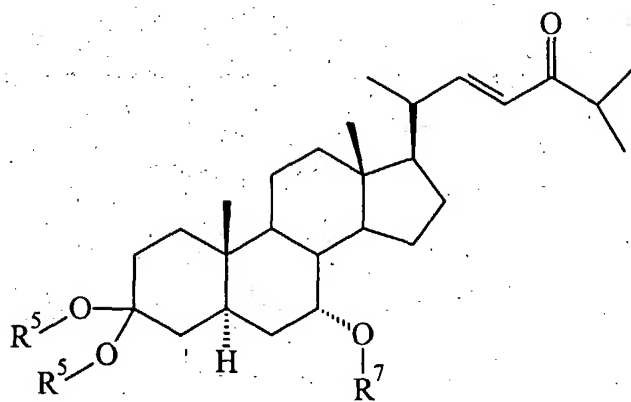


(43); and

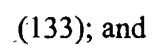
converting, under sufficient conditions, the compound according to formula 43 to squalamine or a salt thereof.

45. A method according to claim 41, wherein compound 129 is converted to compound 134 as follows:

converting, under sufficient conditions, the compound according to formula 129 to a compound according to formula 132:



(132);



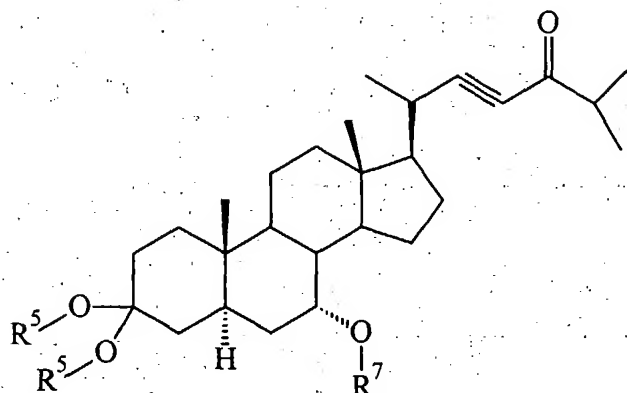
converting, under sufficient conditions, the compound according to formula 133 to the compound according to formula 134.

46. A method according to claim 41, wherein compound 129 is converted to compound 134 as follows:

converting, under sufficient conditions, the compound according to formula 129 to a compound according to formula 115:

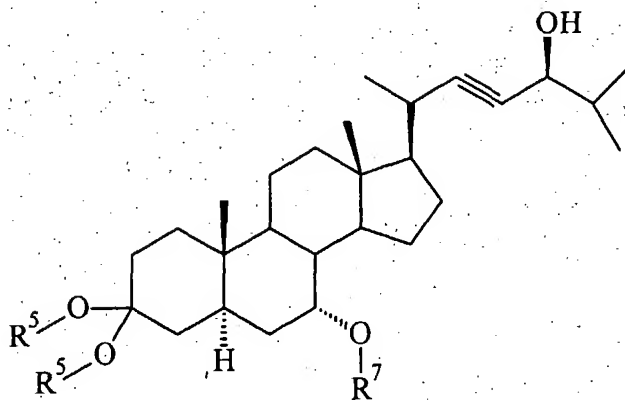


converting, under sufficient conditions, the compound according to formula 115 to a compound according to formula 116:



(116);

converting, under sufficient conditions, the compound according to formula 116 to a compound according to formula 117:

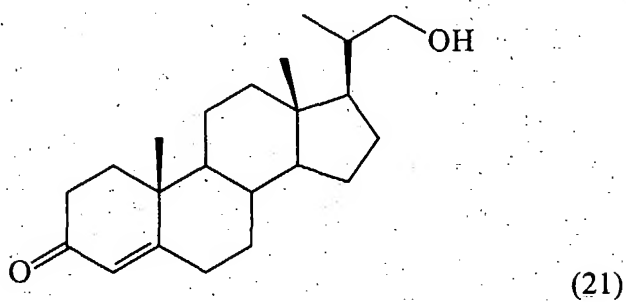


(117); and

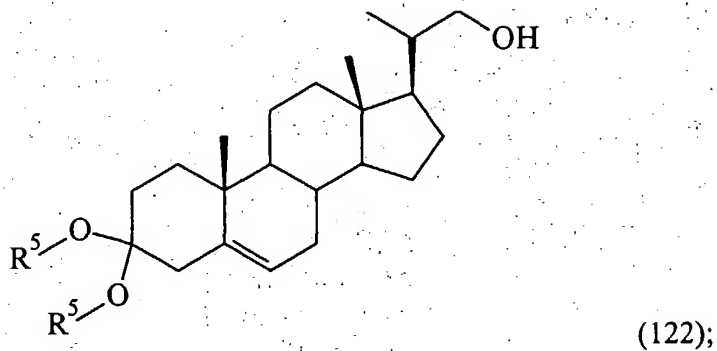
converting, under sufficient conditions, the compound according to formula 117 to the compound according to formula 134.

47. A method according to claim 41, wherein the compound according to formula 129 is produced as follows:

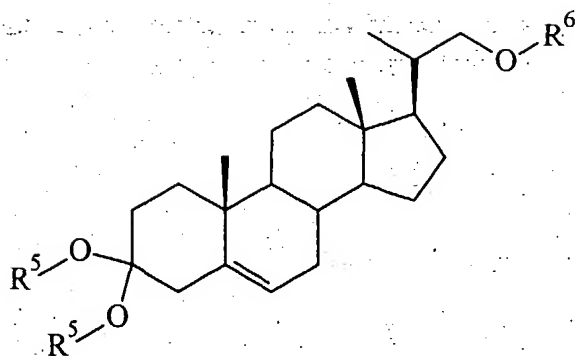
converting, under sufficient conditions, a compound according to formula 21 as follows:



to a compound according to formula 122:



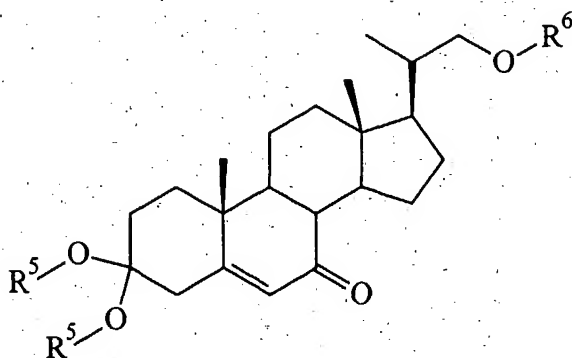
converting, under sufficient conditions, the compound according to formula 122 to a compound according to formula 123:



(123),

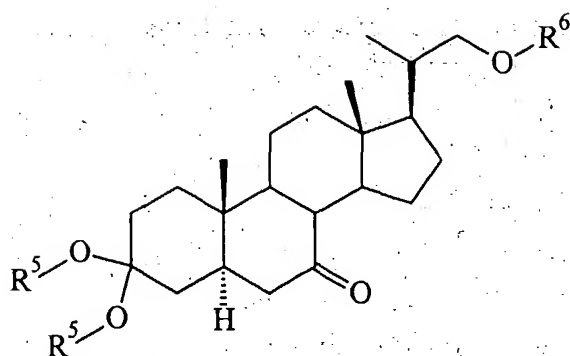
wherein  $R^6$  is a suitable protecting group;

converting, under sufficient conditions, the compound according to formula 123 to a compound according to formula 124:



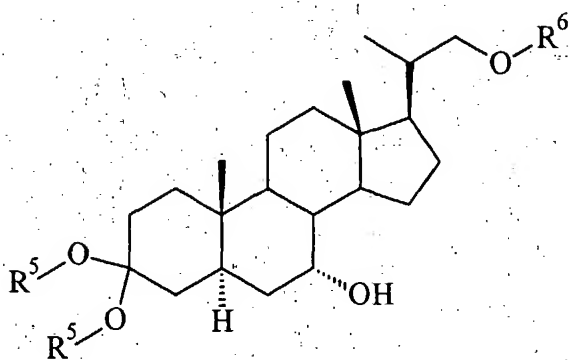
(124);

converting, under sufficient conditions, the compound according to formula 124 to a compound according to formula 125:



(125);

converting, under sufficient conditions, the compound according to formula 125 to a compound according to formula 126:

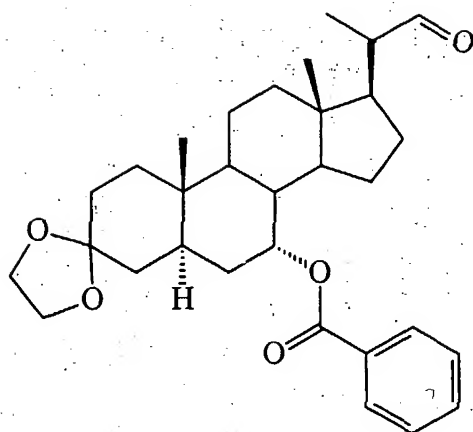


(126);

converting, under sufficient conditions, the compound according to formula 126 to a compound according to formula 127:

The chemical structure shows a steroid nucleus with the following features:
 

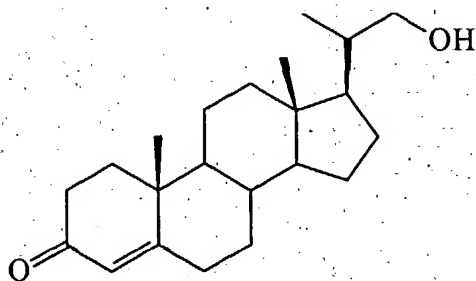
- At C-3, there are two  $R^5$  groups attached via oxygen atoms.
- At C-5, there is a hydrogen atom (H) attached with a dashed bond, indicating it is on the same side as the  $R^5$  groups.
- At C-7, there is an  $R^7$  group attached via an oxygen atom with a dashed bond, indicating it is on the same side as the C-5 hydrogen.
- At C-13, there is a methyl group (represented by a wedge bond) and a 2-hydroxypropyl group (represented by a wedge bond).



(29),

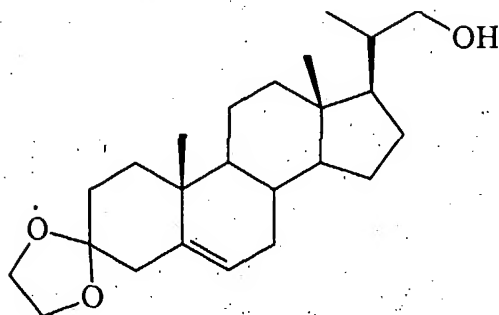
which is produced as follows:

converting, under sufficient conditions, a compound according to formula 21 as follows:



(21)

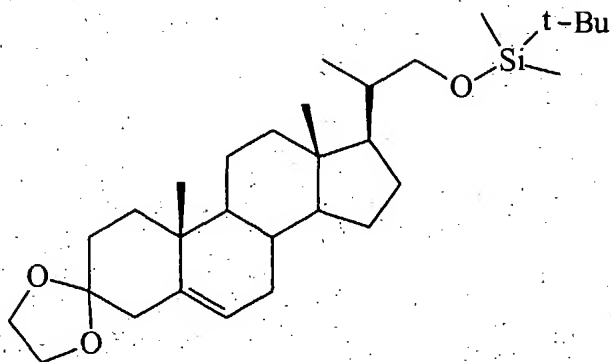
to a compound according to formula 22:



(22);

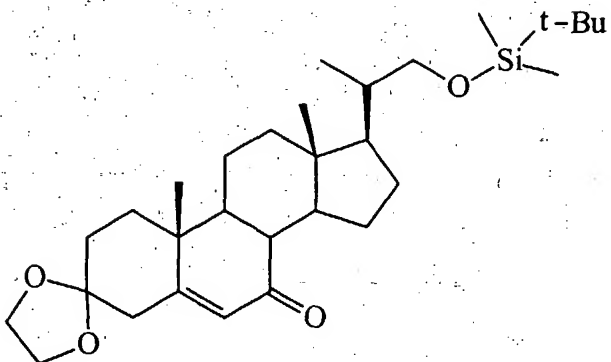


converting, under sufficient conditions, the compound according to formula 22 to a compound according to formula 23:



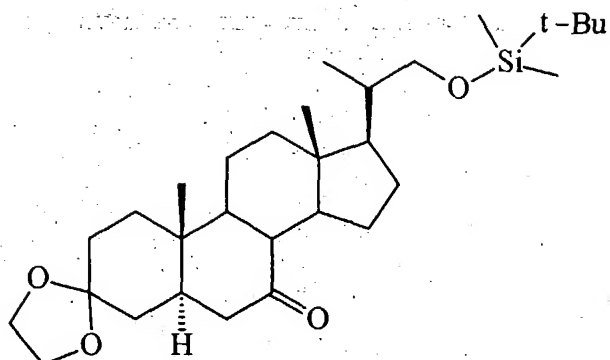
(23);

converting, under sufficient conditions, the compound according to formula 23 to a compound according to formula 24:



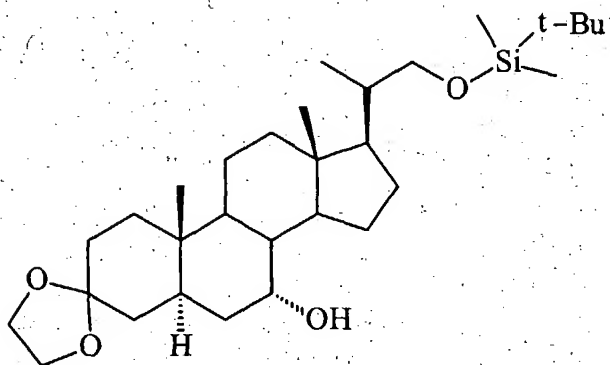
(24);

converting, under sufficient conditions, the compound according to formula 24 to a compound according to formula 25:



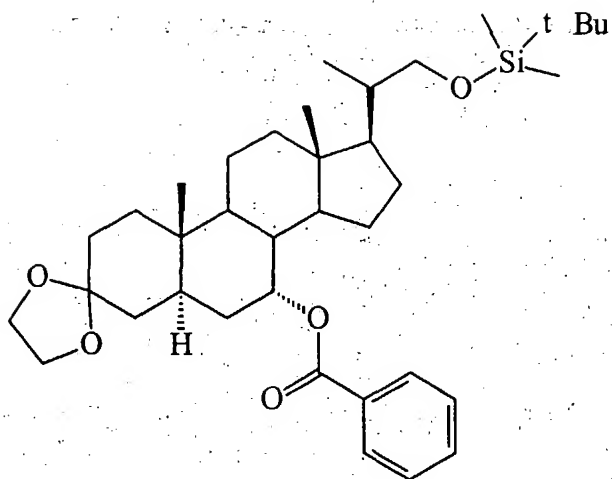
(25);

converting, under sufficient conditions, the compound according to formula 25 to a compound according to formula 26:



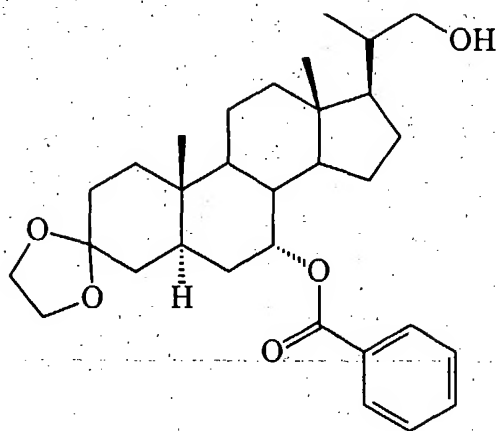
(26);

converting, under sufficient conditions, the compound according to formula 26 to a compound according to formula 27:



(27);

converting, under sufficient conditions, the compound according to formula 27 to a compound according to formula 28:

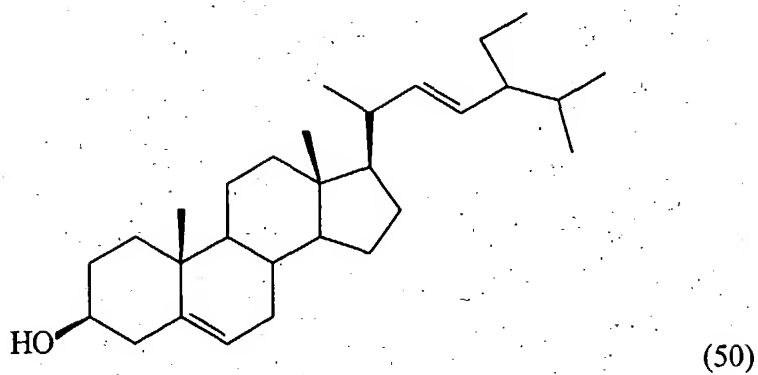


(28); and

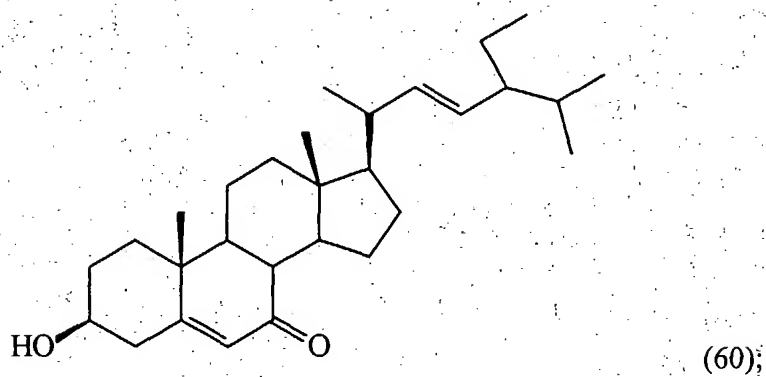
converting, under sufficient conditions, the compound according to formula 28 into the compound according to formula 29.

49. A method according to claim 41, wherein the compound according to formula 129 is produced as follows:

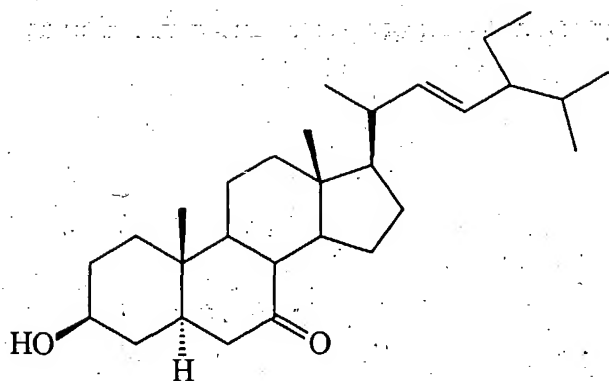
converting, under sufficient conditions, a compound according to formula 50 as follows:



to a compound according to formula 60:

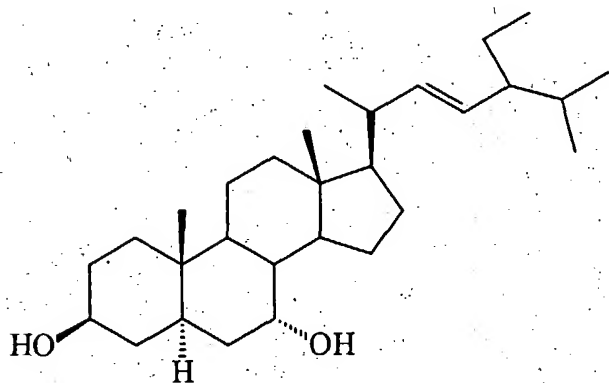


converting, under sufficient conditions, the compound according to formula 60 to a compound according to formula 61: \_\_\_\_\_



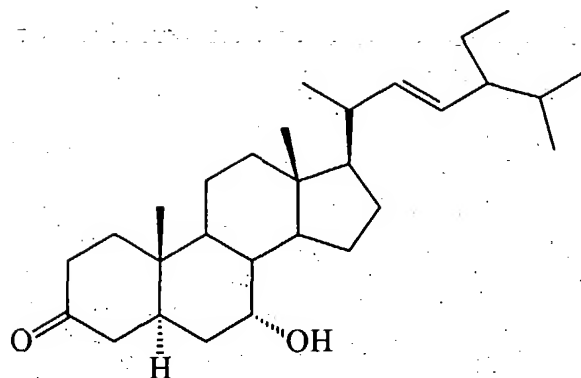
(61);

converting, under sufficient conditions, the compound according to formula 61 to a compound according to formula 62:



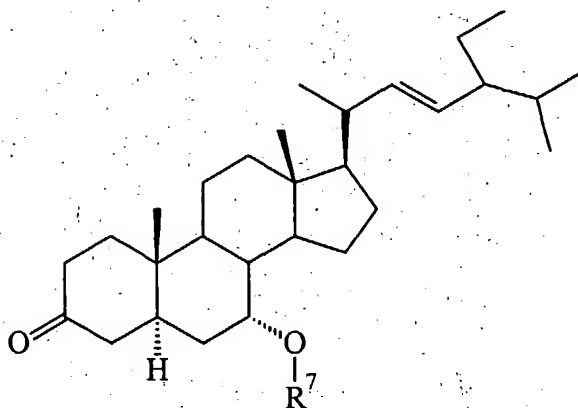
(62);

converting, under sufficient conditions, the compound according to formula 62 to a compound according to formula 63:



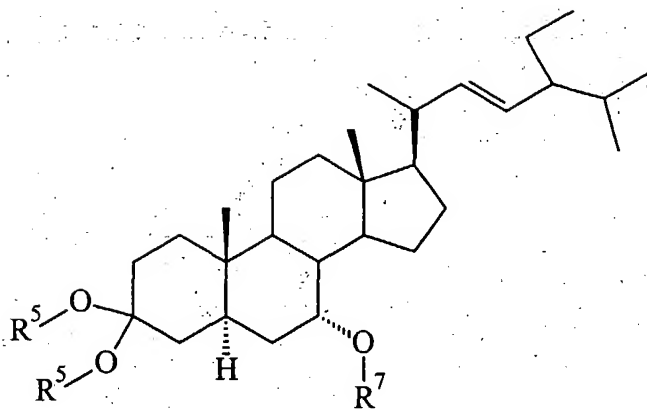
(63);

converting, under sufficient conditions, the compound according to formula 63 to a compound according to formula 164:



(164);

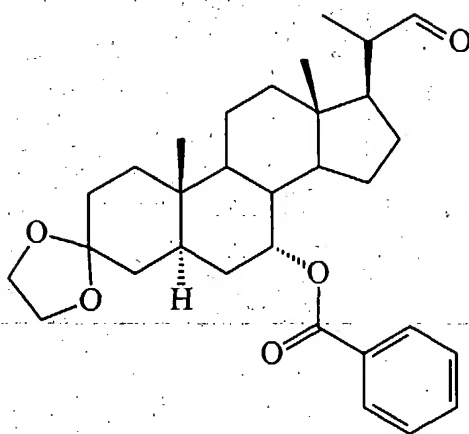
converting, under sufficient conditions, the compound according to formula 164 to a compound according to formula 165:



(165); and

converting, under sufficient conditions, the compound according to formula 165 to the compound according to formula 129.

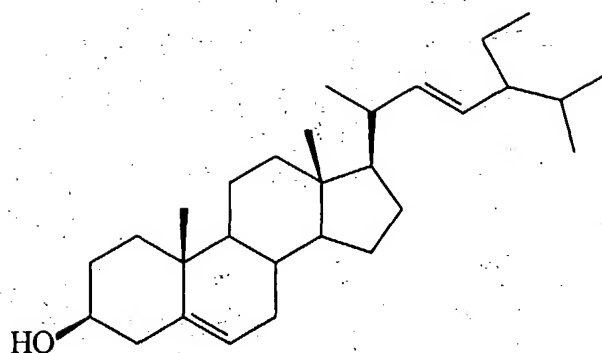
50. A method according to claim 41, wherein the compound according to formula 129 is a compound according to formula 29:



(29),

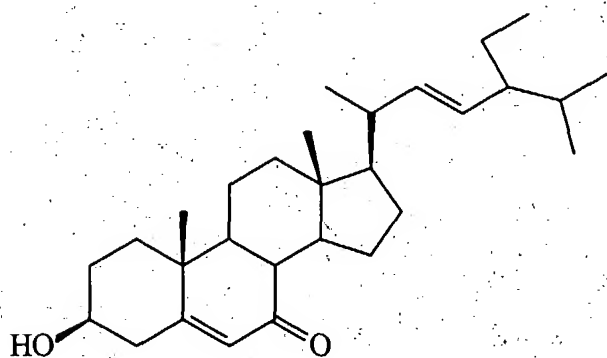
which is produced as follows:

converting, under sufficient conditions, a compound according to formula 50 as follows:



(50)

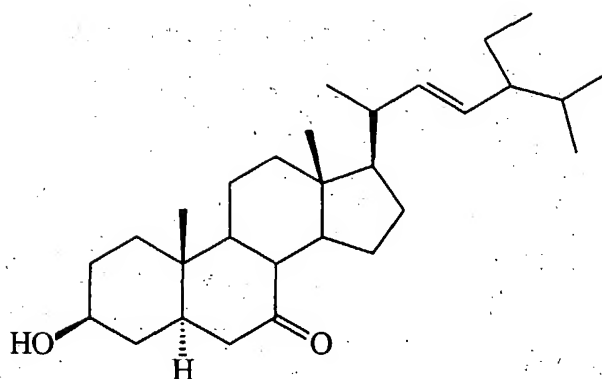
to a compound according to formula 60:



(60);

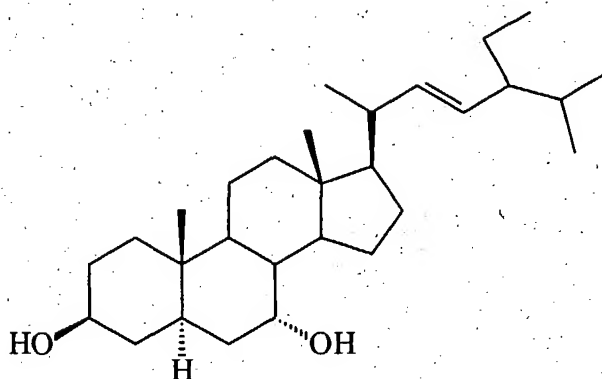
converting, under sufficient conditions, the compound according to formula 60 to a  
compound according to formula 61:





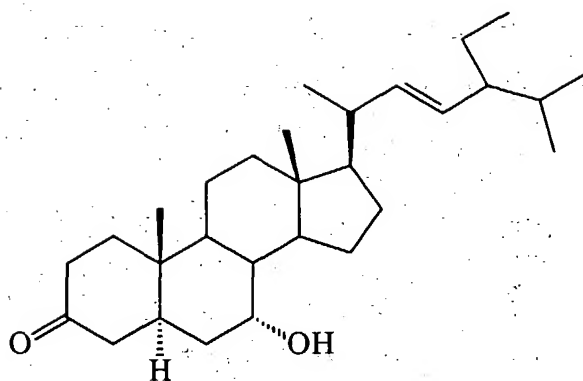
(61);

converting, under sufficient conditions, the compound according to formula 61 to a compound according to formula 62:



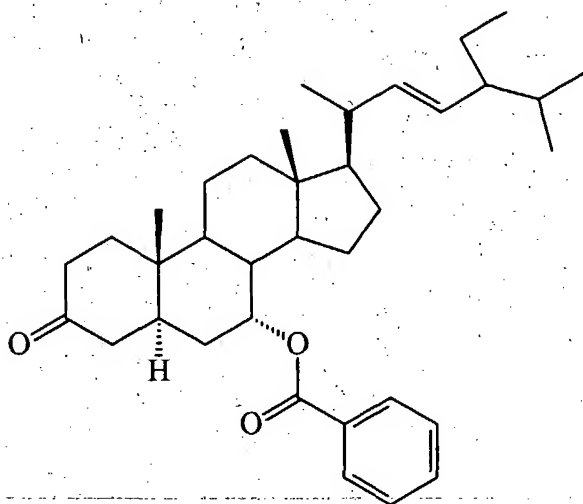
(62);

converting, under sufficient conditions, the compound according to formula 62 to a compound according to formula 63:



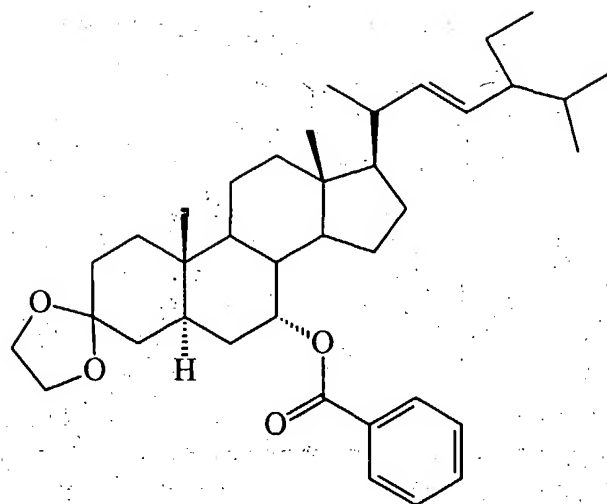
(63);

converting, under sufficient conditions, the compound according to formula 63 to a compound according to formula 64:



(64);

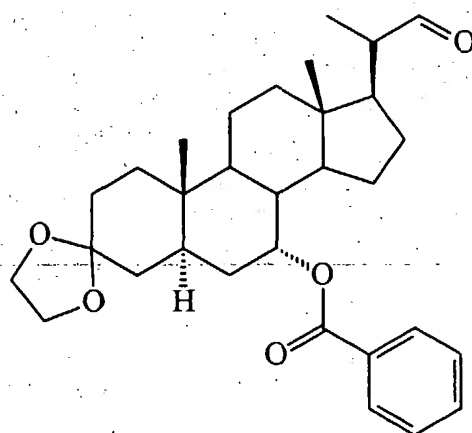
converting, under sufficient conditions, the compound according to formula 64 to a compound according to formula 65:



(65); and

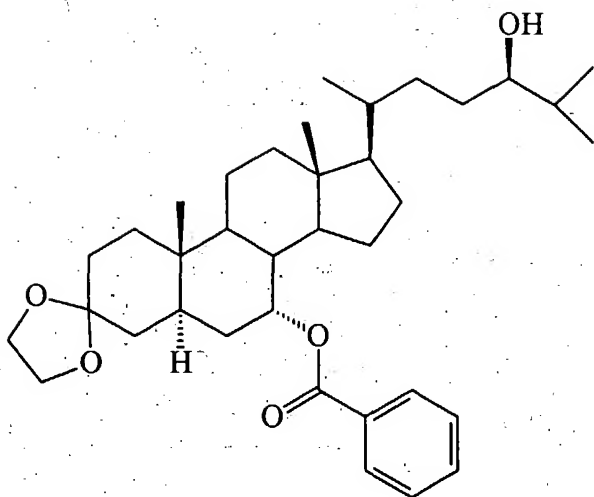
converting, under sufficient conditions, the compound according to formula 65 to the compound according to formula 29.

51. A method according to claim 41, wherein the compound according to formula 129 is a compound according to formula 29:



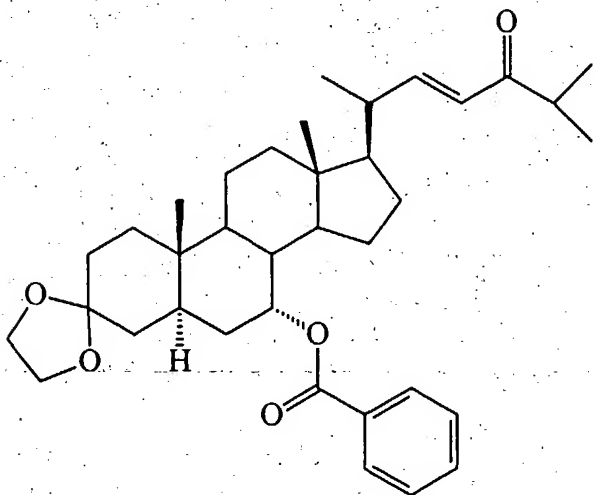
(29), and

the compound according to formula 134 is a compound according to formula 34:



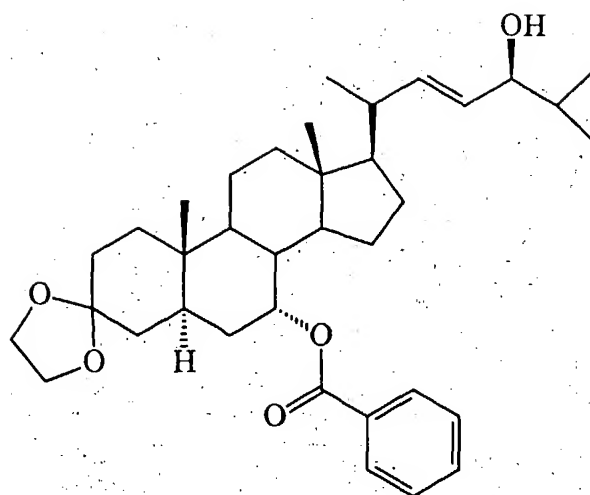
(34),

wherein the compound according to formula 34 is produced by converting the compound according to formula 29, under sufficient conditions, to a compound according to formula 32:



(32);

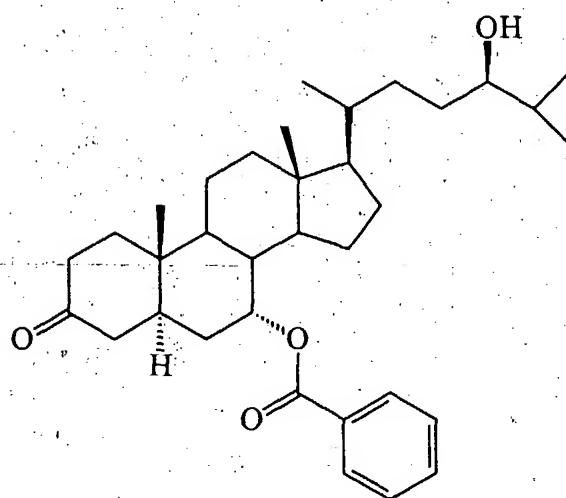
converting, under sufficient conditions, the compound according to formula 32 to a compound according to formula 33:



(33); and

converting, under sufficient conditions, the compound according to formula 33 to the compound according to formula 34.

52. A method according to claim 51, wherein the compound according to formula 135 is as follows:



53. A method according to claim 52, wherein the compound according to formula 136 is as follows:

PATENT  
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